

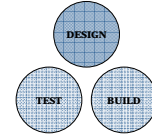
Designing for People

Jon Kolko
Savannah College of Art & Design

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Overview

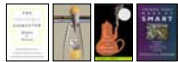
- Don Norman
- Visibility
- Mappings & Affordances
- Constraints
- Switches, Labels, Visibility & Feedback
- Slips & Mistakes
- Designing for Errors



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Don Norman

- Engineer & Psychologist from MIT
- Nielsen Norman group
- Study human behavior, physical interactions, product design & usability



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Visibility

.. indicates the correlation between intended actions and actual operations



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Visibility (continued)

.. indicates crucial distinctions in products



Visibility (continued)


.. effects of operations provide feedback



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Visibility (continued)

.. effects of operations provide feedback



The slide features two images. On the left is a small, square inset image of a light switch. To its right is a larger, rectangular image showing a massive explosion in a town square, with a person running away from the viewer towards the blast. The explosion is bright orange and yellow, with a large plume of white smoke rising into the sky.

Visibility (continued)

"Whenever the number of possible actions exceeds the number of controls, there is apt to be difficulty" (22).

What are examples of this difficulty?

"The good relationship between the placement of the control and what it does makes it easy to find the appropriate control for a task" (23).

What are examples of this good relationship?

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Mapping

- a technical term : the relationship between two things
- in this case, relationship between controls & movements, and the results in the world
- natural mapping takes advantage of physical analogies and cultural standards, leading to immediate understanding
- doors, lights, telephones all use mapping

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Mapping (continued)

"Natural mapping, by which I mean taking advantage of physical analogies and cultural standards, leads to immediate understanding. For example, a designer can use spatial analog: to move an object up, move the control up" (23).

What are examples of natural mapping?

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Affordances

"the difficulty of dealing with novel situations is directly related to the number of possibilities" (81).

when we encounter a novel product, we use information to try to deal with it:

- information in our head (**memory**)
- information in the world (**affordances**)

What is an example of an affordance?

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Affordances

- refer to the perceived and actual properties of the thing
- speak primarily about the fundamental properties that determine just how the thing could possibly be used
- affordances provide strong clues to the operations of things.



The slide contains four small square images arranged horizontally. From left to right: a close-up of a grey steering wheel with a Volkswagen logo; a yellow and black power drill; a wooden chair with a curved back; and a white ceramic pitcher with a handle.

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Affordances

"Affordances can signal how an object can be moved, what it will support, and whether anything will fit into its crevices, over it, or under it" (82).

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Software Affordances

Which software program is currently active?
How do you know?

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Software Affordances

How does this "afford" clicking?

How does this "afford" dragging?

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Software Affordances

How do you move the toolbar?

How do you resize this window?

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Constraints

What is a constraint?

- Physical constraints
- Semantic constraints
- Cultural constraints
- Logical constraints

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Constraints

- help direct users towards understanding of products
- help direct designers towards solution of a problem

"The constraints by themselves are often not sufficient to determine the proper reassembly of the device – mistakes do get made – but the constraints reduce the amount that must be learned to a reasonable quantity" (62).

How can you use constraints to your advantage as a designer?

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Constraints : Physical

"Physical limitations constrain physical operations" (84)



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Constraints : Semantic

"Semantic constraints rely upon the meaning of the situation to control the set of possible actions" (85)



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Constraints : Cultural

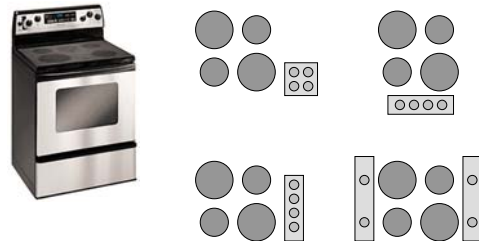
"Some constraints rely upon accepted cultural conventions, even if they do not affect the physical or semantic operation of the device" (85).



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Constraints : Logical

"A logical relationship between the spatial or functional layout of components and the things that they affect"



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Switches, Labels, Visibility & Feedback

Be wary of falling back on switches & labels!



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Slips & Mistakes

"Slips result from automatic behavior, when subconscious actions that are intended to satisfy our goals get waylaid en route..."

Mistakes result from conscious deliberations" (105)

What is the difference between a slip and a mistake?

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Errors : Capture Errors

A capture error occurs when "a frequently done activity suddenly takes charge instead of (captures) the one intended" (107)

"I was using a copying machine, and I was counting the pages. I found myself counting 1 2 3 4 5 6 7 8 9 10 Jack Queen King. I have been playing cards recently"

What are other examples of Capture Errors?

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Errors : Description Errors

"Description errors usually result in performing the correct action on the wrong object" (108).

The internal description of the intention was not sufficiently precise.

"I was smoking a cigarette and drawing a picture with a magic marker. I found myself puffing away at the magic marker, getting ink all over my mouth ..."

What are other examples of description errors?

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Errors : Data Driven

Sometimes data-driven activities can intrude into an ongoing action sequence, causing behavior that was not intended.

Substituting a phone number for a zipcode, or mixing up two people with the same first name

What are other examples of data driven errors?

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Errors : Associative Activation Errors

The slips studied by Freud, and made famous by Homer Simpson – you think of something that ought not to be said, and then, to your embarrassment, you say it.

Freudian Slip.

What are other examples of associative activation errors?

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Errors : Loss of Activation Errors

These errors occur when the presumed mechanism - the "activation" of the goals - has decayed from short term memory.

Driving by school, with a different destination, you find yourself parking at school.

What are other examples of loss of activation errors?

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Errors : Mode Errors

"Mode errors occur when devices have different modes of operation, and the action appropriate for one mode has different meanings in other modes"

Smaller digital devices encourage mode errors.

What are some examples of mode errors?

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Errors : Designing for Errors

So, why do we care?

Everyone makes errors. Designers make the mistake of not taking errors into account.

- understand the causes of error and design to minimize those causes
- make it possible to reverse actions - to "undo" them
- make it easier to discover the errors that do occur
- change the attitude towards errors

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Memory

- short term (or working memory) vs. long term
- secret codes, steps in a process
- reminders : visual cues remind us of progress

"The critical memory aids provided by the external information are absent, and so the task or item may not be remembered. A folk saying captures this situation well: 'Out of sight, out of mind' " (72).

What are some examples of visual cues in products that remind us of progress?

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Summary

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